

GREENSCENE

M A G A Z I N E

South Carolina's Environmental News for Educators ● "News Teachers Can Use!"

On the Scene...

Welcome to the first issue of "The GreenScene Magazine."

The goals of this magazine, which will be published quarterly by the S.C. Department of Health and Environmental Control (DHEC), are many. The primary goal, however, is to provide teachers with information, materials and resources on environmental topics that they can use in the classroom.

Overall, the magazine will provide a one-stop shop of the environmental education programs offered by DHEC. The programs are many and varied and include resources and materials on air, water, recycling, energy and even coastal issues (see page 3).

In addition, the magazine will provide articles on current environmental issues affecting South Carolina. The articles will provide the latest information on environmental topics and, when possible, will include supplementary information including lessons (from "Action for a cleaner tomorrow," see page 4) that can be used, a brief glossary and other sources for information.

The lead article in our premier edition, for example, is on the drought that has impacted the state. Not only does the article provide in-depth information, it provides Web addresses for more information.

The magazine also will provide an announcement, update or follow-up of DHEC environmental education programs, projects, events and activities.

In short, this magazine is for you, the teacher. We hope you enjoy it and most importantly, use it. Thank you.

– DHEC's Environmental
Outreach Workgroup

Recent drought conditions emphasize need for water conservation in S.C.

By Stephán Bullock

In July 2002, the S.C. Department of Natural Resources (DNR) declared most of South Carolina to be in extreme drought status, the worst of four state classifications. The decision was made based on below normal precipitation, record low surface water, stream flow and groundwater indicators, and the impending risk of forest and wildfires.

Did you know South Carolina has experienced drought conditions since June 1998, the longest drought period since the 1950s? The annual precipitation totals are below normal except for 1998, when there was a very wet period from January through April. According to Milt Brown, acting state climatologist for DNR, the four-year rainfall deficit ranges from 16.37 inches in Charleston to 59.01 inches in Columbia.

WHAT IS A DROUGHT? In general, drought is defined as an extended period – a season, a year or several years – of deficient rainfall relative to the statistical multi-year average for a region. However, there are dozens of more specific drought definitions used around the world. They are defined according to the lack of rain over various time periods or measured impacts such as reservoir levels or crop losses. Because of the various ways drought is measured, an objective drought definition has yet to be produced upon which everyone can agree.

According to Cary Allen, a meteorologist for WACH-TV in Columbia, drought cannot officially relate to deficient rainfall by itself. "There are a combination of variables that factor into the local drought scenario. A definition of drought by South Carolina standards is not receiving enough rainfall to support the ecosystem that South Carolina requires for lakes, water consumption and agricultural interests."

Continued on the following page

Water Conservation Tips

- Fix all leaky, faucets, toilets and pipes.
- Don't use your toilet as a waste basket. Flush only when necessary.
- Don't let the water run while brushing your teeth, shaving and lathering in the shower.
- Keep a container of drinking water in the refrigerator instead of running the tap until it is cold.
- Sweep – don't hose off – driveways, sidewalks and patios.
- Turn off the hose when not in use and use a nozzle that can be shut off or adjusted.
- Water lawns in the morning or evening to prevent rapid evaporation during the heat of the day.
- Place a layer of mulch around trees and plants to help retain water.

S.C. DROUGHT WEB SITES:

S.C. State Drought Program Web Site
<http://water.dnr.state.sc.us/climate/sco/drought.html>

Pictures of Drought Conditions in S.C.
http://hemingwaysouthcarolina.com/drought_2002.htm
<http://home.att.net/~ruth-anne-lee/townsend.html>

S.C. Governor Jim Hodges Tours
Drought-stricken Pee Dee Area
<http://www.state.sc.us/governor/photos.html>

National Oceanic
and Atmospheric Administration (NOAA)
Drought Information Center
<http://www.drought.noaa.gov/>

South Carolina Office of Climatology
<http://water.dnr.state.sc.us/climate/sco/>

U.S. Drought Monitor
<http://www.drought.unl.edu/dm/monitor.html>

National Drought Mitigation Center
<http://enso.unl.edu/index.html>

WATER CONSERVATION WEB SITES:

www.dnr.state.sc.us/climate/sco/50ways.html

www.dnr.state.sc.us/climate/sco/ourwater.html

www.epa.gov/region4/water/drinkingwater/waterconservation.htm

www.epa.gov/watrhome/you/intro.html

WATER CONSERVATION ACTIVITIES:

- Encourage students to observe their own daily water consumption habits and compare them with those of other family members. Make a water journal and keep track of your water use for a day or a week.
- Determine how much water is used or misused daily in a home or at school. Identify certain ways to conserve water.
- Discuss the importance of water for our daily needs and how water contributes to our quality of life as Americans.

"There is no true definition that matches every situation," Allen said. "If we received 50 inches of rain in January and then it never rained for the rest of the year, climate records would indicate we had an average year of rainfall. But farmers would say it was too dry to plant anything and therefore, we would suffer through the effects of an agricultural drought."

TYPES OF DROUGHT: All droughts are not the same. They can be characterized as meteorological, agricultural or hydrological. The degree and severity of a drought depends on both its duration and intensity. Drought typically has three phases:

- A **meteorological** drought is defined as a deviation from normal precipitation over a period of time for a specific region.
- An **agricultural** drought occurs after a meteorological drought and is the lack of adequate soil moisture needed for a certain crop to grow and thrive during a particular time.
- A **hydrological** drought occurs when precipitation has been reduced for an extended period of time and water supplies found in streams, lakes, rivers and reservoirs are deficient.

WHICH TYPE OF DROUGHT IS AFFECTING YOUR COUNTY?

According to David Stooksbury, Georgia state climatologist, different parts of the state can be in varying degrees of the different kinds of drought. Meteorological drought comes and goes as frequently, and as quickly, as rainstorms do.

Stooksbury explains that an agricultural drought is based on moisture levels in the top 24 or so inches of soil — where plants need it — and where conditions can change dramatically with one good rainstorm. It also resets every year.

Hydrological drought is much deeper. Hydrological conditions — surface and groundwater levels and flows — are measured continuously, drought or not, so it covers a longer time period with no resetting. So while meteorological drought comes and goes, agricultural drought does the same, but a little more slowly, and hydrological drought takes many years to get into and out.

Droughts are as much a natural part of the climate system as are floods. The extent and severity of a drought depends on both its duration and intensity. Rain showers or thunderstorms may provide short-lived relief from the current drought, but they would not solve the problem. That's why voluntary (sometimes mandatory) water conservation efforts are enacted. Typically, rain and snow during the fall and winter will recharge lakes, streams and groundwater supplies as a normal part of the water cycle. Also a flood or hurricane, unfortunately with devastating side effects, will bring a drought to a swift end.

It should not take a drought to make people realize how crucial water is for our health and well-being. We tend to take clean water for granted, and although it is one of our most precious natural resources, remember, it is also a limited resource.

Stephán Bullock is the drinking water education coordinator for DHEC's Bureau of Water.

WEATHER AND KIDS is a new science program designed to assist teachers in educating students about the basics of weather. Produced by WIS-TV Chief Meteorologist Ken Aucoin, a free CD-ROM is available to teachers and homeschooling parents. For more information and to register, visit www.weatherandkids.com.

2002 is the Year of Clean Water

By Anne Marie Johnson

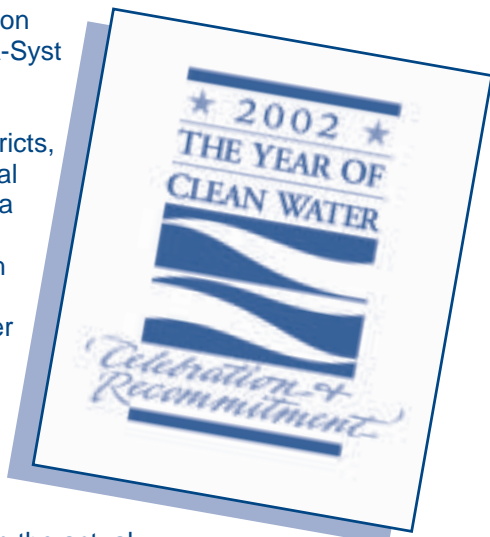
This year the Clean Water Act, the milestone legislation that protects our nation's water resources, celebrates its 30th anniversary. The U.S. Congress, along with the nation's governors including Gov. Jim Hodges, and a host of national organizations proclaimed 2002 as the Year of Clean Water.

In celebration of the Clean Water Act's anniversary, the S.C. Department of Health and Environmental Control (DHEC) along with the S.C. Department of Natural Resources, the S.C. Parks Service, the S.C. Forestry Commission, Clemson University Extension Service's Home-A-Syst Program, the S.C. Association of Conservation Districts, the U.S. Geological Survey and Saluda Shoals Park encouraged South Carolinians to participate October 18 in National Water Monitoring Day. This celebration, the Year of Clean Water's primary event, was held on the actual anniversary of the enactment of the Clean Water Act. It provided an excellent opportunity for enhancing public appreciation for the importance of our water resources, educated young people about water quality issues and provided a snapshot of water quality 30 years after the passage of the Clean Water Act.

Participants checked the vital signs of local waterbodies as they recorded information on temperature, water cloudiness, acidity and oxygen levels. They entered this information on a national Web site where monitoring data from around the country can be viewed. School groups were encouraged to participate.

For more information on the Year of Clean Water and National Water Monitoring Day events in South Carolina, visit www.scdhec.net/cleanwater.

Anne Marie Johnson is the runoff pollution outreach coordinator for DHEC's Bureau of Water.



DHEC ENVIRONMENTAL OUTREACH PROGRAMS:

Champions of the Environment is a student recognition program that encourages environmental involvement and awareness. The program promotes hands-on learning by recognizing students with exemplary environmental projects that focus beyond the classroom. The program is jointly sponsored by DuPont, International Paper, WIS-TV and DHEC. For more information, visit www.scdhec.net/champions.

The Bureau of Air Quality (BAQ) staff are available to provide presentations on various air quality issues. Educational materials for teachers and students are available free of charge. Many of the fact sheets, regulations and other materials may be downloaded from the Bureau of Air Quality Web site, www.scdhec.net/baq. Additional resources include ozone forecasts as well as expert speakers on acid rain, mobile source emissions and ozone awareness.

The Bureau of Water (BOW) provides a variety of educational outreach programs covering non-point source pollution, drinking water and wetlands education. Free presentations and educational materials are available upon request. In addition, DHEC's Water Watch program encourage South Carolina's citizens (schools, scouts and community groups) to become stewards of the state's waterways. Water Watch activities include conducting shoreline surveys, litter clean ups and storm drain tagging. More information is available on-line at www.scdhec.net/water.

The Office of Ocean and Coastal Resource Management (OCRM) offers a speakers' bureau that can address issues ranging from beach erosion and dune protection to best management plans for coastal communities. Programs are available for K-12 classes, college classes and professionals. For more information, visit www.scdhec.net/ocrm.

The Office of Solid Waste Reduction and Recycling (Office) manages "Action for a cleaner tomorrow" ("Action"), an activity based, interdisciplinary K-12 curriculum supplement that can serve as a starting place for incorporating basic environmental education in the classroom. In addition to learning about solid waste issues like recycling and waste reduction, the curriculum covers energy, air and water issues as well. In a three-hour workshop, teachers can learn how the supplement works. Each teacher who completes the training receives a CD-ROM version of "Action." Workshops are provided by DHEC at no cost to schools or teachers.

The Office, in partnership with the S.C. Energy Office, also provides an energy conservation awareness program entitled Energy 2 Learn (E2L). It includes other energy related programs, events and publications. The Palmetto Energy Awards Program (PEAP) offers students the opportunity to earn prizes for completing teacher-approved, energy projects. E2L: The Summer Workshop is an annual event held to spotlight new and existing energy and environmental education programs and materials. E2L also offers publications like "The Energy Factbook" and the "Science Fair Project Guidebook."

The Green Driver Project targets high school driver education classes, providing them with information about how driving and maintaining a vehicle impacts the environment. Students learn about the importance of recycling used motor oil, maintaining their vehicles, conserving energy, protecting the air and water, preventing litter and promoting driver safety.

Finally, in partnership with International Paper, the Office offers Love A Tree South Carolina, an activity based program that focuses on forest stewardship and paper recycling.

For more information on any of the Office's programs, please visit www.scdhec.net/recycle or call 1-800-768-7348.

Ozone is not just another season

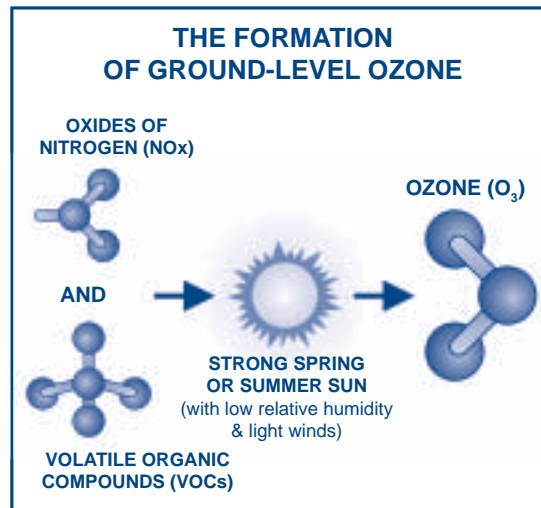
By Amy Curran

There are the four seasons.
There's a holiday season. There's
football season.

And there's ozone season.

The ozone season is the time of
year – May through September –
when conditions, like rising
temperatures and increased traffic,
are favorable for ground-level
ozone to form. Ground-level ozone
can pose a serious threat to
human health and the
environment. Given that, the S.C.
Department of Health and
Environmental Control's (DHEC) Bureau of Air Quality
monitors ground-level ozone during the season.

There are two types of ozone. "Good" ozone is up high
in the stratosphere and protects us from the sun's
harmful rays. Ground-level ozone, or "bad" ozone, is
located in the troposphere and forms when nitrogen
oxides and volatile organic compounds react in the
presence of sunlight and heat. Sources of nitrogen
oxides include cars, trucks and industry, which emit
pollutants when fossil fuels are burned. Examples of
volatile organic compounds include natural sources such
as pine trees as well as vapors emitted from paints,



glues and solvents. The largest
contributors to ground-level ozone
in South Carolina are cars and
trucks.

Why should you be concerned?
Potential human health risks are
the greatest cause for concern.
When the ground-level ozone
concentration is high, it can cause
eye irritation, headaches, sore
throats, shortness of
breath, wheezing and coughing.
Children and people with
pre-existing lung diseases,
such as emphysema, asthma and
chronic bronchitis, are especially
sensitive to high concentrations of

ground-level ozone. However, anyone working or
exercising outside also may be affected.

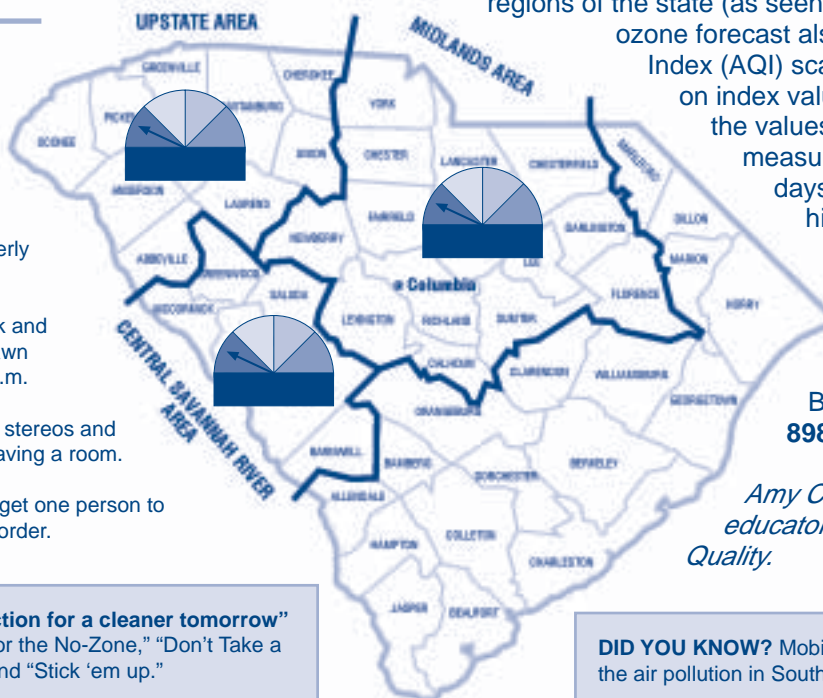
Secondly, ground-level ozone has a negative effect on
the environment. In fact, it's responsible for a \$1 to \$2
billion reduction in crop yield in the United States every
year. Ground-level ozone interferes with plants' abilities
to produce and store food, making them more
susceptible to disease, insects, other pollutants and
harsh weather.

An ozone forecast is available at www.scdhec.net/baq/ozone
from May 1 through September 30 for three
regions of the state (as seen on the map provided). The
ozone forecast also provides an Air Quality
Index (AQI) scale that displays information
on index values, descriptions of what
the values mean, and precautionary
measures that people can take on
days when concentrations are
high. Statewide media also
provide the ozone forecast.

FIVE EASY WAYS TO REDUCE AIR POLLUTION

1. Carpool.
2. Keep car tires properly
inflated.
3. Fill up your gas tank and
use gas-powered lawn
equipment after 6 p.m.
4. Turn off lights, TVs, stereos and
computers when leaving a room.
5. Stay in for lunch or get one person to
pick up everyone's order.

See these related "Action for a cleaner tomorrow"
lessons: "The Ozone or the No-Zone," "Don't Take a
Lichen for Pollution" and "Stick 'em up."



For more information
about ground-level
ozone, contact DHEC's
Bureau of Air Quality at (803)
898-4297.

*Amy Curran is the environmental
educator for DHEC's Bureau of Air
Quality.*

DID YOU KNOW? Mobile sources contribute over half of
the air pollution in South Carolina.

Champions names S.C. Environmental Teachers of the Year

By Merritt Kearns

Champions of the Environment (www.scdhec.net/champions) honored the 2001-2002 Environmental Teachers of the Year at the S.C. State Museum in Columbia in May. The top Environmental Teachers of the Year received prize money totaling \$3,000 for their outstanding environmental education programs. Representatives from the Champions partnership, which consists of DuPont, International Paper, WIS-TV and the S.C. Department of Health and Environmental Control (DHEC), presented the awards to the following outstanding teachers:

Forest Acres Elementary School, Habitat Heroes Club, Teacher: Jerry Robertson

The students from Jerry Robertson's "Habitat Heroes" team at Forest Acres Elementary in Easley take the environment seriously. Students in all grade levels recycle in their classrooms. Students help to reduce waste in the lunch room by composting. These students also planted more than 350 trees around their school for Arbor Day. Students are active in the community and attended public meetings and spoke on behalf of their recycling initiatives. The "Habitat Heroes" have an advisory committee that oversees the club's projects, including a Web page and brochure.

Horrell Hill Elementary School, Living Every Day as Earth Day, Teachers: Saudah Collins and Danielle Morrison

Teachers Danielle Morrison and Saudah Collins and their students are "Living Every Day as Earth Day." Students began the school year with a composting project and also started an indoor garden. Then they moved on to studying habitats and environmental interdependence. The group worked with four other local elementary schools on an environmental outreach program. The environmental outreach program includes a plant and animal laboratory, student workshops, an environmental drama and musical production, monthly newsletters and a Web page. Students give

environmental information to local residents, including facts on natural resource conservation, recycling and habitat preservation. In addition, they give presentations to other classes on the environmental facts they have learned.

Oakview Elementary School, Apple Orchard Project, Teachers: Kathy Miller, Ruth Power, Patsy Edwards and Lauren Giles

Oakview Elementary has a comprehensive environmental education program that uses hands-on activities to teach students the role they will play as future keepers of the Earth. In addition to a nature trail, schoolyard habitat, composting center and recycling program, students are tending to a recently planted apple orchard on the school's campus. Each class has its own tree which it will care for by watering and weeding on a regular basis. Students will follow the growth of their tree and eventually hope to harvest apples. Students and teachers work with volunteers, including parents, community members, Clemson Extension staff and a local apple grower on this project.

The 2002-2003 Environmental Teachers of the Year will share prize money totalling \$10,000 to improve and expand their school's environmental programs. Teachers also will be awarded \$500 monthly grants. The grants are awarded on a competitive basis to South Carolina's kindergarten through 12th grade students and teachers each month of the school year. Teachers who receive the monthly grant award are eligible for the \$10,000 Environmental Teacher of the Year awards at the end of the school year.



To download the application or to find out more about the Champions of the Environment program, please call (803) 898-4394 or visit www.scdhec.net/champions.

Merritt Kearns is the coordinator for DHEC's Champions of the Environment program.

Pictured: Jerry Robertson and students from Forest Acres Elementary School (top); Saudah Collins and Danielle Morrison with students from Horrell Hill Elementary School (center); and Kathy Miller, Ruth Power and students from Oakview Elementary School (bottom).

South Carolina students enjoy Earth Camp

By Holly Storey



The S.C. Department of Health and Environmental Control (DHEC) and International Paper held an environmental camp for about 60 rising fifth- and sixth-graders at Camp Long in Aiken. Earth Camp, a four-day event, took place on July 17-20, with activities that stressed environmental awareness and education.



"We were thrilled by the enthusiasm and response of the campers," said Paula Webster with International Paper. "Earth Camp provided

participants with a unique opportunity to learn more about South Carolina's environment. It was educational and fun, too."



Campers attended sessions that focused on recycling, energy, air, water and forestry. The sessions contained hands-on activities, videos and nature walks. Campers also enjoyed swimming, canoeing, horseback riding, volleyball and a ropes course.

The campers presented group projects at the end of camp to show parents and fellow campers what they learned. Two groups performed skits. One dressed in costumes representing different air pollutants and the sun to show the formation of ground-level ozone; another performed a similar skit with water pollution as the topic. Two other groups hosted a rotating carnival with games and activities teaching parents the environmental lessons they had learned during the camp.



Each of DHEC's 12 Environmental Quality Control District Offices sponsored four campers from their area, thus providing children throughout the state with an opportunity to participate in this educational camping experience.

In addition to co-hosting the camp, International Paper also sponsors the Love A Tree South Carolina educational program that focuses on forestry stewardship and paper recycling.

Holly Storey is the environmental education coordinator for DHEC's Office of Solid Waste Reduction and Recycling.

Top: A camper reuses a cereal box to make her camp journal.

Second from top: Another camper makes a smores solar cooker from a poster mailing tube.

Above: Dr. Andy Fields teaches campers about red-tailed hawks and other birds of prey during a hands-on demonstration.

Right: Pictured are this year's Earth Camp participants.



S.C. educators are 'energized' at annual summer workshop

By Holly Storey

More than 150 teachers from across South Carolina attended the fifth annual Energy 2 Learn Summer Workshop on June 26.

Teachers received a CD-ROM of "Action for a cleaner tomorrow: A South Carolina Environmental Curriculum Supplement" after completing a training seminar during the workshop. Other sessions provided participants information about Love A Tree South Carolina, a forestry stewardship and paper recycling program sponsored by the Office and International Paper, and the newly revised Palmetto Energy Awards Program (PEAP). This program offers incentives, including certificates, bookmarks and T-shirts, for completing energy related projects.

Teachers also were introduced to the Green Driver Project, a new program that targets high school driver's education classes and offers information about recycling used oil, filters and bottles. It also focuses on energy conservation, litter prevention, and air and water protection as well.

The centerpiece of the Green Driver Project, a new video entitled "DHEC 1: Behind the Oil Change," premiered during the workshop and will be shown to the students participating in the new program. The video teaches students the importance of recycling using oil and the impact of improper disposal. It is presented as a satire of the popular teen television programs "Dawson's Creek" and "VH1: Behind the Music." Jim Forbes, the narrator of the latter program, narrates the new DHEC video.

Workshop participants also played "Environmental Jeopardy," hosted by Columbia radio personality Tony Clyburn. Contestants answered questions about air, energy, recycling and water issues for the chance to win duffle and messenger bags made from recycled tires.

The workshop, sponsored by the S.C. Energy Office, the S.C. Department of Health and Environmental Control's (DHEC) Office of Solid Waste Reduction and Recycling (Office) and the U.S. Postal Service (Greater S.C. Cluster), was held at Seawell's Restaurant in Columbia. For more information about Energy 2 Learn or any of the programs listed above, call **1-800-768-7348** or visit **www.scdhec.net/recycle**.



Teachers from across the state attended the fifth annual Energy 2 Learn Summer Workshop in June. They attended sessions on air, water, energy and recycling from "Action for a cleaner tomorrow." Teachers also went on a "Treasure Hunt" for educational and promotional materials from other state and federal environmental outreach programs.

DHEC ENVIRONMENTAL EDUCATION COORDINATORS AND CONTACTS:

For more information about the information or programs mentioned in this publication, please contact the appropriate coordinator listed below:

BUREAU OF AIR QUALITY

Amy Curran (803) 898-4297
curranaa@dhec.state.sc.us
Education Coordinator

BUREAU OF WATER

Anne Marie Johnson ... (803) 898-4178
johnsoam@dhec.state.sc.us
Runoff Pollution Outreach Coordinator

Stéphán Bullock (803) 898-4180
bullocks@dhec.state.sc.us
Drinking Water Education Coordinator,
Hands-on, Interactive Presentations

Merritt Kearns (803) 898-4394
kearnsms@dhec.state.sc.us
Champions of the Environment
Coordinator, K-12 Environmental
Education Grants

Carol Roberts (803) 898-3542
robertck@dhec.state.sc.us
Public Information Coordinator,
Bureau of Water Web Site

Lynne Lasalle (803) 898-4211
lasalli@dhec.state.sc.us
Water Watch Coordinator,
Volunteer Water Quality Groups

DIVISION OF HEALTH HAZARD EVALUATION

Heath Educator 1-888-849-7241

OFFICE OF OCEAN AND COASTAL RESOURCE MANAGEMENT

Mike Robertson (843) 744-5838
robertma@dhec.state.sc.us
Education Coordinator

OFFICE OF SOLID WASTE REDUCTION AND RECYCLING

Holly Storey (803) 896-4233 or
Education Coordinator 1-800-768-7348
storeyhl@dhec.state.sc.us

Richard Chesley (803) 896-4209 or
Manager 1-800-768-7348
cheslerl@dhec.state.sc.us

Resource Center 1-800-768-7348

More information about DHEC's environmental education programs also can be found on the Web at
www.scdhec.net/eqc

DHEC's Calendar of Environmental Events

N O V E M B E R 2 0 0 2

- Nov. 1** Recycle Guys Awards Nominations Due
- Nov. 8** America Recycles Day (ARD) Recycling Adventure, Fort Jackson
- Nov. 9** ARD Fair, Chau Ram County Park, Oconee County
- Nov. 15** America Recycles Day (for more information, visit www.americarecyclesday.org)
- Nov. 15** ARD Recycling Adventure, York County Museum, Rock Hill
- Nov. 15** ARD Office Recycling Drop-off, Columbia
- Nov. 15** ARD Recycling Family, Teacher and School of the Year Award Nominations Due (for more information, visit www.scdhec.net/recycle)
- Nov. 19** Green Driver Project Presentation, Northwestern High School, York County
- Nov. 22** ARD Challenge Cards Due to DHEC's Office of Solid Waste Reduction and Recycling
- Nov. 26** State ARD Challenge Card Drawing (National Card Drawing is Dec. 10)

S.C. schools receive recycling 'mini-grants'

Thirty-six South Carolina schools recently received recycling "mini-grants" through a program managed by DHEC's Office of Solid Waste Reduction and Recycling.

The mini-grants will be used to buy recycling bins as well as resource and composting materials for new or existing recycling programs at the schools. Field trips, Earth Day and America Recycles Day activities also will be funded by the mini-grants.

Funding for the grants program was provided by the S.C. Soft Drink Association, the National Association for PET Container Resources, the Coca-Cola Bottling Company and the American Plastics Council.

For information about the recycling mini-grants, call **1-800-768-7348** or visit www.scdhec.net/recycle.

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Permit #939

S.C. Department of Health and Environmental Control
2600 Bull Street • Columbia, SC 29201-1708

